

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 90-077
NPDES NO. CA0028851

RENEWAL OF WASTE DISCHARGE REQUIREMENTS FOR:

APPLIED MATERIALS, INC.
3050 BOWERS AVENUE FACILITY
CITY OF SANTA CLARA, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. Applied Materials, Inc., hereinafter called the discharger, submitted an NPDES permit application (Report of Waste Discharge) in early (January-March) 1990 for reissuance of NPDES Permit No. CA0028851.
2. The discharge of wastewater from the Applied Materials 3050 Bowers Avenue Facility (Building 1) is currently regulated by Waste Discharge Requirements, Order No. 88-171, adopted by the Board on December 21, 1988. The current Order revised the Waste Discharge Requirements for this facility, Order No. 85-70, originally adopted by the Board on June 19, 1985.
3. The site identified herein is on the National Priority List (NPL). The Board is the lead State agency under the Multi Site Cooperative Agreement (MSCA) and is responsible for directing and coordinating remedial activities to satisfy the requirements under the Superfund Amendments and Reauthorization Act (SARA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
4. Applied Materials operates a manufacturing facility for vapor deposition equipment used in the semiconductor industry. Building 1 is located on a nine-acre site at 3050 Bowers Avenue in Santa Clara, about 6.4 miles south of San Francisco Bay and within one mile of Calabazas, Saratoga, and San Tomas Aquino Creeks. Building 1 is in an area of light industrial and commercial development and has been in operation since 1970.

5. Wastewater is produced as a result of site cleanup activities authorized originally by Board Order No. 86-71 and more recently by revised site cleanup requirements of Board Order No. 89-167 adopted September 20, 1989.
6. The waste stream consists of up to 50,000 gallons per day of polluted groundwater. Three wells and one sump are operated to control and clean up groundwater pollution by extraction pumping. The extracted groundwater is treated by air stripping prior to discharge to the storm drain system tributary to San Tomas Aquino Creek and South San Francisco Bay.

Treatment reduces the concentrations of VOCs in the influent to acceptable limits in the effluent (discharge) as indicated herein from analytical results of March, 1990 (in micrograms per liter): 1,1-dichloroethane (1,1-DCA) from 36 to 0.3, 1,2-dichloroethane (1,2-DCA) from 11 to <0.1, cis-1,2-dichloroethylene (cis-1,2-DCE) from 17 to <0.1, 1,1,1-trichloroethane (1,1,1-TCA) from 100 to 1.5, trichloroethylene (TCE) from 3.1 to <0.1, Freon 11 from 7 to <0.1, Freon 113 from 27 to <0.1, methylene chloride from 3 to <0.5, and total volatile organic chemicals (VOCs) from 204.1 to 2.2.

7. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface waters, and groundwater.
8. The beneficial uses of surface water in the area, including water of South San Francisco Bay (South Bay) include:
 - a. Contact and non-contact water recreation
 - b. Wildlife habitat
 - c. Preservation of rare and endangered species
 - d. Estuarine habitat
 - e. Warm fresh water and cold fresh water habitat
 - f. Fish spawning and migration
 - g. Industrial service supply
 - h. Shellfish harvesting
 - i. Navigation
 - j. Ocean commercial and sport fishing
9. The Basin Plan prohibits discharges of wastewater which has particular characteristics of concern to beneficial uses (a) at any point in San Francisco Bay south of the Dumbarton Bridge and (b) at any point where the wastewater does not receive a minimum initial dilution of at least 10:1 or into any nontidal water, deadend slough, similar confined water, or any immediate tributary thereof.

10. The Basin Plan allows for exceptions to the prohibitions referred to in Finding 9 above when it can be demonstrated that a net environmental benefit can be derived as a result of the discharge.
11. Exceptions to the prohibitions referred to are warranted because the discharge is an integral part of a program to clean up polluted groundwater and thereby produces a net environmental benefit, and because receiving water concentrations are expected to be below levels that would affect beneficial uses.
12. The Basin Plan prohibits discharges of all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to waters of the Basin. The discharger's groundwater extraction and treatment system and associated operation, maintenance, and monitoring plan constitutes a presently acceptable control program for minimizing the discharge of toxicants to waters of the State.
13. Onsite operations require relatively high volumes of water for three separate industrial processes. Applied Materials purchases water from the City of Santa Clara for use in these processes, and pretreats the water prior to use.
14. The discharger has investigated ways of potentially using the treated extracted water, and concluded, based on considerations of water quality and cost-effectiveness, that it is not feasible to reuse the water or reinject it into a receiver, and POTWs have adequate sources of reclaimed water.
15. The State Water Resources Control Board and this Regional Board have adopted policies which favor reclamation and reuse of extracted groundwater whenever feasible. This Board favors adopting an NPDES permit which authorizes the discharge of extracted groundwater only where reclamation, reuse, and discharge to a POTW are neither technologically nor economically feasible.

This Regional Board believes reclamation and reuse of extracted groundwater are presently technologically feasible, and if not now economically feasible, may in the near future become economically feasible and/or necessary. The Board further believes the discharger should continue to investigate ways of potentially using the extracted water. The results of such investigation should be reported to the Board annually.

16. Effluent limitations of this Order are based on the Basin Plan, State and U. S. Environmental Protection Agency (EPA) Plans and Policies, and best technical judgement. Also considered in the determination of effluent limits were the

EPA Region IX draft guidance "NPDES Permit Limitations for Discharge of Contaminated Groundwater: Guidance Document", and the San Francisco Bay Regional Water Quality Control Board Internal Memorandum dated February 16, 1990, "Proposed NPDES Permit Limits For Common Organic Pollutants Found at Service Stations and Other Groundwater Clean Up Sites."

17. The issuance of waste discharge requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.
18. The Board has notified the discharger and interested agencies and persons of its intent to issue an Order for the discharge (renewal) and has provided them with an opportunity for a public hearing and an opportunity to submit written views and recommendations.
19. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. EFFLUENT LIMITATIONS

1. The discharge of all conservative toxic and deleterious substances above those levels which can be achieved by a program acceptable to the Board, is prohibited.
2. The discharge of waste containing constituents in excess of the following limits is prohibited:

<u>Constituent</u>	<u>Instantaneous Maximum(uq/l)</u>
chloroform	5
1,1-dichloroethane(1,1-DCA)	5
1,2-dichloroethane(1,2-DCA)	0.5
1,1-dichloroethylene(1,1-DCE)	5
1,2-dichloroethylene(1,2-DCE)	5
cis-1,2-dichloroethylene(c-1,2-D)	5
trans-1,2-dichloroethylene(t-1,2-D)	5
1,2-dichloropropane(1,2-DCP)	5
methylene chloride	5
tetrachloroethylene(PCE)	5
1,1,1-trichloroethane(1,1,1-TCA)	5

1,1,2-trichloroethane(1,1,2-TCA)	5
trichloroethylene(TCE)	5
acetone	5
vinyl chloride	0.5
trichlorotrifluoroethane(Freon 113)	5
trichlorofluoromethane(Freon 11)	5
dichlorotrifluoroethane	5
carbon tetrachloride	0.5
Total concentration of all volatile organic chemicals (VOCs)	5

3. The pH of the discharge shall not exceed 8.5 nor be less than 6.5 units.
4. In any representative set of samples, the discharge of waste shall meet the following limit of quality:

TOXICITY:

The survival of rainbow trout test fishes in 96-hour bioassays of the effluent as discharged shall be a median of 90% survival and a 90 percentile value of not less than 70% survival.

B. RECEIVING WATER LIMITATIONS

1. The discharge of wastes shall not cause the following conditions to exist in waters of the State at any place at levels that cause nuisance or adversely affect beneficial uses:
 - a. Floating, suspended, or deposited macroscopic particulate matter or foam;
 - b. Bottom deposits or aquatic growths;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the

receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:
 - a. Dissolved oxygen: 5.0 mg/l minimum. The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation.
 - b. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.
 - c. Un-ionized ammonia (as N) 0.025 mg/l annual mean
0.4 mg/l maximum at any time
3. Neither the treatment nor the discharge of waste shall create pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code.
4. The discharger shall not cause a violation of any applicable water quality objective of the Basin Plan most recently adopted for this Region.
5. The discharger shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. PROVISIONS

1. The discharger shall comply with all sections of this Order immediately upon adoption by the Board.
2. The discharger shall comply with the Self-Monitoring Program as adopted by the Board and as may be amended by the Executive Officer.

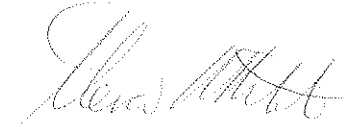
3. This Order includes all items of the attached "Standard Provisions, Reporting Requirements and Definitions" dated December 1986.
4. This Order authorizes only the discharge of treated extracted groundwater to a storm sewer on the site at 3050 Bowers Avenue in Santa Clara, which is tributary to San Tomas Aquino Creek, and only as provided herein.
5. The maximum combined pumping rate of all extraction wells and sumps shall not exceed 50 gallons per minute (gpm) without prior written approval of the Board's Executive Officer.
6. In addition to any other report required by this Order, the discharger shall submit on an annual basis for the term of the permit a report, "Annual Report - Disposal of Extracted Groundwater". This report shall be submitted by February 1 of the current year, for the preceeding calendar year; and shall address the concerns expressed by this Regional Board Resolution No. 88-160, Regional Board Position on the Disposal of Extracted Groundwater From Groundwater Cleanup Projects, and provide an update on the discharger's efforts to reuse or reclaim all or part of the extracted groundwater. The report for calendar year 1990, due by February 1, 1991, shall include (1) a detailed evaluation of the feasibility of using extracted groundwater for industrial and/or other non-potable purposes which are presently supplied from other sources, and (2) a proposal to begin the use of extracted groundwater as a replacement water supply for such purposes, on or before July 31, 1992.

The proposal shall include a schedule for implementation and shall indicate goals to be achieved as percentages of extracted water to be reused and/or reclaimed and dates for achievement.

7. The discharger shall develop and submit a Best Management Practices (BMP) program to the Board by April 1, 1991. The BMP program shall be consistent with the EPA regulations 40 CFR 125, Subpart K and the general guidance contained in the "NPDES Best Management Guidance Document", EPA Report No. 600/9-79-045, December 1979 (revised June 1981). A BMP program acceptable to the Executive Officer shall be implemented by October 1, 1991.
8. Any noncompliance with a requirement of this Order shall be reported as stated in Section C.10 of the "Standard Provisions, Reporting Requirements and Definitions" referred to in Provision 3.

9. This Order shall serve as a National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective ten (10) days after the date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.
10. This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the discharger from his liability under Federal, State or local laws, nor create a vested right for the discharger to continue the waste discharge.
11. Provisions of these waste discharge requirements are severable. If any provision of these requirements is found to be invalid, the remainder of these requirements shall not be affected.
12. Order No.88-171 is hereby rescinded.
13. This Order expires June 20, 1995. The discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 20, 1990.


STEVEN R. RITCHIE
Executive Officer

Attachments

Standard Provisions, Reporting
Requirements and Defin-
itions, December 1986
(modified January, 1987)

Self-Monitoring Program

June 22, 1990

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

APPLIED MATERIALS, INC.
3050 BOWERS AVENUE FACILITY
CITY OF SANTA CLARA
SANTA CLARA COUNTY

NPDES NO. CA0028851

ORDER NO. 90-077

CONSISTS OF

PART A, dated December 1986
modified January 1987

and

PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

<u>Station</u>	<u>Description</u>
I-1	At a point in the groundwater extraction/treatment system immediately prior to treatment.

B. EFFLUENT

<u>Station</u>	<u>Description</u>
E-1	At a point in the groundwater extraction/treatment system immediately following treatment.

C. RECEIVING WATERS

<u>Station</u>	<u>Description</u>
C-1	At a point in San Tomas Aquino Creek 300 feet but not more than 600 feet downstream from the discharge point.

II. SCHEDULE OF SAMPLING AND ANALYSIS

- A. The schedule of sampling and analysis shall be that as shown in Table I attached.

III. MODIFICATION OF PART A, DATED JANUARY 1987

All items of Self-Monitoring Program Part A, dated December 1986 and as modified January 1987, and as supplemented herein, shall be complied with:

- A. Additions to Part A: Section G.4.d.5: "In the twice annual open-scan for effluent samples, all chromatic peaks for purgeable halocarbons and/or volatile organics shall be identified and quantified. If previously unquantified peaks are identified in any sample, these peaks shall be confirmed within four weeks or at the next sampling event based on analyses of samples using chemical standards necessary to achieve proper identification and quantification.

"Results from each required analysis and observation, including any confirmatory analysis, shall be submitted as laboratory originated data summary sheets in the monthly self-monitoring reports. Results shall also be submitted for any additional analyses performed by the discharger at the specific request of the Board for parameters for which effluent limits have been established and provided to the discharger by the Board, and shall be submitted with the report for the month in which the analysis was made."

B. Modifications to Part A: for the following, the discharger shall comply with the Sections as changed and reported herein.

1. Section D.2.a. is changed to read:

Samples of effluent and receiving waters shall be collected at times coincident with influent sampling unless otherwise stipulated. The Regional Board or Executive Officer may approve an alternative sampling plan if it is demonstrated that expected operating conditions warrant a deviation from the standard sampling plan.

2. Section D.2.d. is changed to read:

If two consecutive samples of any one constituent or parameter monitored on a weekly or monthly basis in a 30-day period exceed the effluent limit or are otherwise out of compliance, or if the required sampling frequency is once per month or less (quarterly, annually or other) and the sample or parameter exceeds the limit or is otherwise out of compliance, the discharger shall implement procedure(s) acceptable to or approved by the Board Executive Officer, on a case by case basis.

3. Section D.2.e. is changed to read:

If any instantaneous maximum limit is exceeded, the discharge shall terminate immediately upon discovery of the excess, and shall not resume until the cause of the violation is found and corrected and/or the Board Executive Officer authorizes resumption of the discharge.

4. In Section F.1, the phrase "(at the waste treatment plant)" is changed to read, "(at the discharger's facility at 3050 Bowers Avenue in Santa Clara)".

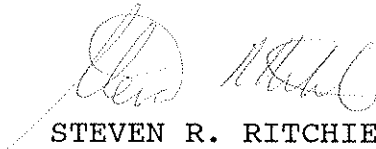
5. Information requested in Section G.4.e. shall be prepared in a format similar to EPA form 3320-1 and submitted only to the Regional Board.
6. The Annual Report required in Section G.5. shall be submitted in place of the end of the year monthly report.
7. The GC/MS scan required twice annually at E-1 shall be substituted for the monthly organic chemical analysis at this sampling station during the months when the GC/MS scan samples are collected.

IV. MISCELLANEOUS REPORTING

- A. If any chemicals or additives are proposed to be used in the operation and/or maintenance of the extraction/treatment system, the discharger shall obtain the Board's concurrence prior to use. The details concerning such approved use shall be reported in the next periodic report submitted to the Board.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 90-077.
2. Was adopted by the Board on June 20, 1990.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer or Regional Board.


STEVEN R. RITCHIE
Executive Officer

Attachment: Table I

TABLE I
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	I-1	E-1	C-1
TYPE OF SAMPLE	G	G	G
Flow rate (mgd)	D		
Total Suspended Matter (mg/l & kg/day)		Q	
Fish Tox'y 96-hr. % Surv'l in undiluted waste		Y	
Ammonia Nitrogen (mg/l & kg/day) {1}			
pH (units)	M	M	2/Y
Dissolved Oxygen (mg/l & Saturation)		2/Y	2/Y
Temperature (Centigrade)		Q	Q
Metals (Standard Methods For Priority Pollutants)		Y	
Identifiable Organic Chemicals {2}	M	M	2/Y
GC/MS Open Scan (EPA Method 624/625)		2/Y	

LEGEND FOR TABLE I

Type of Station

I = intake and/or water supply station
E = waste effluent station
C = receiving water station

Type of Sample

G = grab sample

Frequency of Sampling

D = once each day
M = once each month
Y = once each year
2/Y = once in March and once in September
Q = quarterly, once in March, June, September, and December

REMARKS FOR TABLE I

{1} Total ammonia nitrogen shall be analyzed and un-ionized ammonia calculated whenever fish bioassay test results fail to meet the specified percent survival.

{2} Identifiable Organic Chemicals refers to volatile organic compounds and associated organic constituents and compounds, whether identified as chlorinated, halogenated, or otherwise, and include but are not limited to the following:

- chloroform
- 1,1-dichloroethane
- 1,2-dichloroethane
- 1,1-dichloroethylene
- 1,2-dichloroethylene
- cis-1,2-dichloroethylene
- trans-1,2-dichloroethylene
- 1,2-dichloropropane
- methylene chloride
- tetrachloroethylene
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- trichloroethylene
- acetone
- vinyl chloride
- trichlorotrifluoroethane
- trichlorofluoromethane
- dichlorotrifluoroethane
- carbon tetrachloride

Any other organic constituents identified during or as a result of required analyses, and concentrations detected, shall be reported.

Concentrations detected may be reported in micrograms per liter (ug/l) or parts per billion (ppb), or in other commonly acceptable units of measurement. The unit of measurement will be clearly provided with the analysis.